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EXAMINER				
HIGGINS, GERARD T				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/531,962

Applicant(s)

CIOC ET AL.

Examiner

GERARD T. HIGGINS

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 5, 7, 9, 10, 12-17 and 19-28 is/are pending in the application.
- 4a) Of the above claim(s) 21-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 7, 9, 10, 12-17, 19, and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/05/2009 has been entered.

Response to Amendment

2. The amendment filed 02/05/2009 has been entered. Currently claims 1, 2, 4, 5, 7, 9, 10, 12-17, and 19-28 are pending and claims 3, 6, 8, 11, and 18 are cancelled.

Election/Restrictions

3. Newly submitted claims 21-28 are directed to an invention that lacks unity with the invention originally claimed for the following reasons: the storage medium and process of storage include a reflective coating, which is a special technical feature not present in claim 21; furthermore, the previously cited art still applies to claim 1, and therefore there is no special technical feature that as a whole defines the invention over the prior art. Since there is no special technical feature that as a whole defines the

invention over the prior art, there is no corresponding special technical feature that binds the inventions together; hence, the inventions lack unity.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 21-28 are withdrawn from consideration as being directed to a nonelected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

4. Claims 1, 2, 9, 10 is objected to because of the following informalities:
- a. In claim 1, the invention is drawn to "A storage medium" and not "Storage medium."
 - b. In claims 1 and 13, please remove the comma after "having a reflective coating" in the third line of each claim. The presence of the comma leads the portion relating to the placement of the reflective coating to be awkward.
 - c. In claims 1, 2, 9, 10, 13, and 14, the phrase "storage glass material" is awkward and unclear. The term "glass storage material" would appear to be the proper term.
 - d. In claims 19 and 20, the word "Process" is capitalized even though it is not the beginning of a sentence.
- Appropriate correction is required.

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5. Claims 4 and 17 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

a. Claim 4 seeks to say that the metallic ion doping is "on at least one side near a flat surface of one of the at least two interconnected disks comprising the storage medium;" however, this fails to further limit claim 1 because claim 1 sets forth that the metallic ions are transferred into the storage glass material, and not an interconnected disk broadly. The Examiner suggests applicants state "wherein metallic ion doping is arranged in at least one surface of the glass storage material."

b. Claim 17 talks about a deletion method; however, claim 13 is drawn to a method of storing data, and therefore claim 17 fails to further limit claim 13.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 4 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The fact that the metallic ion doping "is arranged *in* at least one side" and also that the doping is done into the storage glass material and not the polymer layer are critical or essential to the practice of the invention, but not

included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicants claim 4 no longer recites applicants invention because it is open to the fact that doping may be performed “on,” which is not supported by applicants’ specification, and also that claim 4 is now open to the possibility that the doping may occur into the polymer layer, which is not supported by applicants’ specification.

8. Claims 4, 5, 7, 9, 10, 12-17, 19, and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to claim 4, the Examiner does not find support in applicants’ specification as originally filed to state that the metallic ion doping is arranged in a “surface of one of the at least two interconnected disks comprising the storage medium.” It appears from applicants’ specification that the metallic ion doping is performed into the glass storage material **only**.

With further regard to claim 4, the Examiner does not find support for the limitation for “a **flat** surface.” It has been held that when an explicit limitation in a claim “is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description **requires** that limitation” (emphasis added). *Hyatt v. Boone*,

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146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998). The Examiner does not find support at page 9, paragraphs 1 and 2 or the Figures for the limitation of "a **flat** surface," and notes that the Figures, including Figure 1, are not drawn to scale and do not necessarily require a flat surface as claimed.

With regard to claim 7, the Examiner does not find support for stating "an optically functional structure **comprising** information for the guidance of a read/write beam" in the specification as originally filed. The optically functional structure does not "comprise" information for the guidance of the read/write beam, it "is" the information for the guidance of the read/write beam. Applicants do not have support for claiming an optically functional structure in this broad manner.

With regard to claim 12, the Examiner does not find support for broadly claiming that the information and data "**comprises** a spatial arrangement of storage material regions with and without metallic particles and ions." The Examiner does not find support at the section applicants have suggested (pg.3, paragraph 2) or throughout the originally filed specification and drawings as has also been suggested. The Examiner notes that applicants have only provided two possible methods for storing data or information (i.e. metallic particles and ions), and not **all** possible methods of storing data as is now broadly claimed.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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10. Claims 1, 2, 4, 5, 7, 9, 10, 12-17, 19, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With initial regard to claims 1, 2, 4, 5, 7, 9, and 10, the claims are indefinite because it is unclear if the claims are drawn to an optical recording medium having a donor layer that **can** have its metallic ions doped into the storage glass material, or if the claims are drawn to an optical recording medium that already has had the metallic ions doped into the storage glass material. The Examiner will seek to treat the claims using both possibilities.

With regard to claim 1, the phrase "upon which is arranged on a least one side a donor medium for metallic ions" renders the claim indefinite because it is unclear to what layer the "upon which" is referring; furthermore, if the "upon which" is referring to the reflective coating, it is unclear if the donor medium can be "on at least one side" of said reflective coating because that seems to imply that the ions would need to cross through the reflective layer to transfer into the storage glass material. For the purposes of examination, the Examiner will treat "upon which" as referring to the "glass storage material."

With further regard to claim 1, the phrase "a donor medium **for** metallic ions" renders the claim indefinite. It is unclear if the word "for" implies that the metallic ions migrate into or out of the donor medium. Perhaps applicants meant "a donor medium of metallic ions."

With further regard to claim 1, the phrase "metallic ions are locally transferred" render the claim indefinite because it is unclear if these are the same metallic ions that are located in the donor medium. Perhaps applicants meant "the metallic ions."

With further regard to claim 1, the term "locally transferred" is a relative term which renders the claim indefinite. The term "locally transferred" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear how local the transfer must be to satisfy this claim. For the purposes of examination, the Examiner will treat this limitation as being anywhere nearby the donor medium.

Claims 2, 4, 5, 7, 9, 10, and 12 recites the limitation "Storage medium" in the first line of each claim. It is unclear if these are meant to be separate and distinct storage media or a further limitation upon the storage medium of claim 1. Perhaps applicants meant "The storage medium."

With regard to claim 2, the term "**localized** metallic ion doping" is a relative term which renders the claim indefinite. The term "**localized** metallic ion doping" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear how localized the doping must be to satisfy this claim. For the purposes of examination, the Examiner will treat this limitation as being anywhere nearby the donor medium. Additionally it is unclear if the "localized metallic ion doping" of claim 2 is the same as "metallic ions are locally transferred from the

donor medium into the storage glass material" of claim 1 or if there is a new doping/transfer of ions occurring.

With further regard to claim 2, the phrase "metallic ions may be converted into metallic particles or aggregations of metallic particles" renders the claim indefinite. It is unclear if the "metallic ions" mentioned here are the same as the metallic ions of claim 1, the localized metallic ion doping of claim 2, both, or if it is a new metallic ion being presented.

With regard to claim 4, the term "near" is a relative term which renders the claim indefinite. The term "near" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what amount of distance comprises "near."

With regard to claim 4, the phrase "metallic ion doping" renders the claim indefinite because it is unclear if the "metallic ion doping" is the same as "metallic ions locally transferred from the donor medium into the storage glass material" or if there is a new doping/transfer of ions occurring.

With regard to claim 5, the claim is indefinite because it contains an improper Markush group (i.e. "selected from the group **comprising** of"). Perhaps applicants meant "selected from the group consisting of."

With regard to claim 9, the phrase "metallic ion doping" renders the claim indefinite because it is unclear if the "metallic ion doping" is the same as "metallic ions

locally transferred from the donor medium into the storage glass material" or if there is a new doping/transfer of ions occurring.

With further regard to claim 9, the term "in proximity of a surface" is a relative term which renders the claim indefinite. The term "in proximity of a surface" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear how close to the surface the doping must be to be considered to be "in proximity of a surface;" furthermore, this term is generally unclear and indefinite as "in proximity of a surface" does not make sense.

With regard to claim 12, the phrase "a spatial arrangement of storage material regions" renders the claim indefinite because it is unclear if the "storage material regions" are the same as the "storage glass material" of applicants' claim 1 or if this is a new storage material.

With further regard to claim 12, the phrase "with and without metallic particles **and** ions" renders the claim indefinite because it is clear to the Examiner that particles and ions do not need to be present together to be the information or data. Applicants have outlined possibilities, wherein only metallic ions can be information and data. Perhaps applicants meant "metallic particles **or** ions," as the original claim language "metallic particles/metallic ions" suggests alternative "or" language.

With further regard to claim 12, the phrase "metallic...ions" renders the claim indefinite because it is unclear if the "metallic...ions" are the same as "metallic ions

locally transferred from the donor medium into the storage glass material" of claim 1 or if there is a new doping/transfer of ions occurring.

With regard to claim 13, the claim is in general indefinite because there is no indication in the claim what constitutes data or information.

With regard to claim 13, the term "local doping" is a relative term which renders the claim indefinite. The term "local doping" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what would comprise a local doping.

With regard to claim 13, the phrase "upon which is arranged on a least one side a donor medium for metallic ions" renders the claim indefinite because it is unclear to what layer the "upon which" is referring; furthermore, if the "upon which" is referring to the reflective coating, it is unclear if the donor medium can be "on at least one side" of said reflective coating because that seems to imply that the ions would need to cross through the reflective layer to transfer into the storage glass material. For the purposes of examination, the Examiner will treat "upon which" as referring to the "glass storage material."

With further regard to claim 13, the phrase "a donor medium **for** metallic ions" renders the claim indefinite. It is unclear if the word "for" implies that the metallic ions migrate into or out of the donor medium. Perhaps applicants meant "a donor medium of metallic ions."

With regard to claim 13, the phrase "is carried out with metallic ions from a donor medium arranged on the storage glass material" is indefinite for two reasons. The first reason is because it is unclear if the metallic ions mentioned here are the same as those previously mentioned in the claim or if there is a new set of metallic ions. The second reason is because it is unclear if "a donor medium" is the same donor medium mentioned previously in the claim or if there is a new donor medium. Perhaps applicants meant "is carried out with the donor medium of metallic ions arranged on the glass storage material."

Claims 14-17 recite the limitation "Process" in the first line of each claim. It is unclear if these are meant to be separate and distinct process or a further limitation upon the process of claim 13. Perhaps applicants meant "The process."

With regard to claim 14, the phrase "by electromagnetic or particle irradiation" renders the claim indefinite because it is unclear if there is a new set of irradiation or if it is the "focused electromagnetic or particle irradiation" of claim 13.

With regard to claim 14, given the fact that claim 13 is a "process for storage of data," it is unclear if the storage of "information" of claim 14 is the same data of claim 13 or if there is new data/information being formed by the process of claim 14.

With regard to claim 14, the term "localized formation of metallic particles" is a relative term which renders the claim indefinite. The term "localized metallic particles" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably

apprised of the scope of the invention. It is unclear how localized they must be formed in order to meet the limitations of this claim.

With further regard to claim 14, the phrase "metallic particles out of metallic ions" renders the claim indefinite because it is unclear if the metallic ions mentioned here are the same metallic ions mentioned previously in the claim, the metallic ions mentioned in claim 13, both, or neither.

With further regard to claim 14, the phrase "with the irradiation in transmission or reflection" is awkward and leads the claim to be indefinite. The words transmission and reflection are adjectives; however, there is no noun that they are modifying.

Claim 15 recites the limitation "the information" in the first and second lines of the claim. There is insufficient antecedent basis for this limitation in the claim.

With further regard to claim 15, the phrase "reading and writing of the information with a laser beam" renders the claim indefinite for three reasons. The first reason is that the process of claim 13 is drawn to a storage method and not a reading method. The second reason is that it is unclear if the "writing of the information" process is the same as the "storage of data" of claim 13 or is a different process. The third reason is that it is unclear if the "laser beam" of claim 15 is the same as the "focused electromagnetic or particle irradiation" of claim 13 or if there is a new source of energy to effectuate writing.

With regard to claim 16, it is unclear what constitutes "metallic particles" since the claim mentions both "metallic particle nuclei" and "metallic particle aggregation," and it is not clear if one, both, or neither are "metallic particles."

With regard to claim 17, the claim is in general indefinite because it does not recite an active method step. It is a narrative claim.

With further regard to claim 17, the phrase "stored information and data" renders the claim indefinite because these terms have not been previously established in claim 13 as to what constitutes "stored information or data."

Claim 19 recites the limitation "the glass storage medium" in the third line of the claim. There is insufficient antecedent basis for this limitation in the claim. Please note that if applicants correct the objections set forth in section 4c above, it would render this rejection moot.

Claim 20 recites the limitation "the electromagnetic or particle irradiation" in the second line of the claim. There is insufficient antecedent basis for this limitation in the claim. Perhaps applicants meant "the focused electromagnetic or particle irradiation"

Claims 13-17, 19, and 20 are, as a whole, narrative and indefinite and do not recite positive method steps, but rather options relating to how the article defined within claim 13 might be used.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 2, 4, 5, 7, 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as obvious over Wu (5,078,771) in view of Nomura et al.'s "Super-Resolution Read-Only Memory Disk with Metal Nanoparticles or Small Aperture," Jap. J. Appl. Phys. Pt. 1, vol. 41(3B) pp. 1876-1879 (March 2002).

This rejection is treating the claims assuming that the product in question has **already** had the metallic ions doped into the storage glass material; hence the limitations in claim 1 that state "whereby by irradiation with a focused laser beam, metallic ions are locally transferred from the donor medium into the storage glass material" is a necessary step in forming the optical recording medium, and is not intended use limitations.

With regard to claims 1, 7, 9, and 10, Wu describes a storage medium comprising a glass dielectric layer, which has an integral ion-exchanged surface layer (IIES layer) that is in the glass substrate and not laminated on top thereof (col. 27, lines 50-63). The IIES layer is formed with the glass substrate by heating the silver ions solution with the glass substrate and subsequent cooling (col. 4, line 56 to col. 5, line 15). Wu states at col. 33, lines 33-35 that a reflective coating may be sputtered onto the IIES layer.

The irradiation of the storage medium and the donor layer "by irradiation with a focused laser beam" to have "locally transferred" metallic ions to create the IIES recording layer in applicants' claim 1 is a product-by-process limitation. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a

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product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." Please see MPEP 2113 and *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The Examiner takes the position that the heating of the glass layer and the silver ion layer to create the IIES layer in Wu is equivalent to applicants' locally transferred ion-exchanged layer formed by focused laser irradiation.

Alternatively, it would have been obvious to one having ordinary skill in the art of the manufacture of optical recording media to use a laser or any form of irradiation to selectively control the heating process that corresponds to the generation of the IIES (recording) layer. This would generate a boundary layer that would have the specific doping properties desired for applicants' intended use. The motivation for using other sources of radiation is it would simplify and reduce the cost of generating the optical recording media; however, Wu fails to specifically disclose or render obvious the polymer layer of claim 1, the optically functional structure in a polymer layer on a side facing the storage glass material of claims 7 and 10, and the doping arranged in proximity of a surface of the storage glass material facing the polymer layer of claim 9.

Nomura et al. disclose the structure of an optical recording medium in their Figure 5.

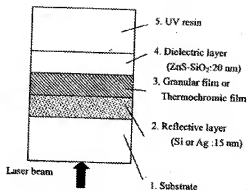


Fig. 5. Cross-sectional view of the sample disk.

Nomura et al. disclose that their granular film comprises small silver particles, wherein reflectivities are changed by increasing the silver particle size. The granular film layer 3 reads on applicants' storage glass material layer (ion-doped layer), the substrate 1 is reads on applicants' polymer layer (Nomura et al. discloses the substrate may be polycarbonate, same as applicants), there is a reflective layer 2 arranged in between the granular film layer and the substrate, and there are tracks, which read on the optically functional structures of claims 7 and 10, on the polycarbonate substrate facing the granular film layer (pp. 1877, col. 2).

Since Nomura et al. and Wu are both drawn to optical recording media featuring layers with dispersed metal particles therein; it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the substrate with an optically functional structure facing in a specific direction of Nomura et al. with the glass dielectric layer comprising an IIES layer and a reflective coating thereon of Wu. The results of this combination would have been predictable to one having ordinary skill in the art of CD/DVD manufacture; furthermore, each element would have performed the same in combination as they had separately. Additionally, Nomura et al. disclose

using his recording medium to increase data capacity and recording density, which is extremely beneficial in the art of CD/DVD manufacture; further, the motivation to provide a means for tracking would be to make sure that the disc could be played in conventional optical recording/reproducing devices. Given the fact that the reflective coating of Wu is placed on top of the IIES layer, it is clear to the Examiner that this combination will result in the IIES layer facing towards the polymer layer, which reads on claim 9, and the optically functional structure of the polymer layer facing the storage glass material.

With regard to claims 2 and 12, the Examiner notes that the limitations of claims 2 and 12 are intended use limitations of the article from claim 1. Intended use limitations are not dispositive of patentability; however, it is also noted that Wu discloses forming reduced elemental silver in the form of specks or particles by application of high energy beams (col. 30, lines 3-21). This reads on the limitations of claims 2 and 12, because the usage of a high energy **beam** intrinsically is a localized formation of particles. Wu provide numerous methods of increasing the yield of these specks or particles at col. 30, line 22 to col. 33, line 13. These are also made with substrates of glass. He discloses that these types of layers are useful in forming DVD's, and hence they can be formed with a reflective layer so that they can be read or recorded in reflective mode (col. 33, lines 18-35).

With regard to claim 4, Wu teaches a glass dielectric layer, which has an integral ion-exchanged surface layer (IIES layer) that is in the glass substrate and not laminated

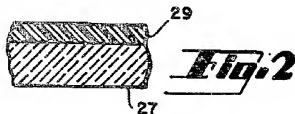
on top thereof (col. 27, lines 50-63). Wu teaches that the base glass article is a glass sheet or plate, which the Examiner deems to have a flat surface (col. 4, lines 51-52).

With regard to claim 5, the IIES layer may be comprised of silver ions (col. 4, lines 22-33).

13. Claims 1, 2, 4, 5, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drexler et al. (4,269,917) in view of Nomura et al. "Super-Resolution Read-Only Memory Disk with Metal Nanoparticles or Small Aperture," Jap. J. Appl. Phys. Pt. 1, vol. 41(3B) pp. 1876-1879 (March 2002) as evidenced by Wu (5,078,771).

This rejection is treating the claims assuming that the product in question has **not** had the metallic ions doped into the storage glass material; hence the limitations in claim 1 that state "whereby by irradiation with a focused laser beam, metallic ions are locally transferred from the donor medium into the storage glass material" represent intended use limitations.

With regard to claims 1, 7, and 10, Drexler et al. teach the data storage medium, which reads on applicants' storage medium, of Figure 2.



The data storage medium is comprised of a substrate 27, which may be made of glass and reads on applicants' storage glass material, and a silver-halide emulsion layer 29,

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which reads on applicants' donor medium for metallic ions (col. 5, lines 57-62 and col. 6, lines 26-30); however, Drexler et al. fail to disclose that the disc structure has a reflective layer and a polymer layer, wherein the reflective layer is situated in between the storage glass material and the polymer layer; further, that the polymer layer has an optically functional structure on a side of the polymer layer facing the storage glass material.

Nomura et al. disclose the structure of an optical recording medium in their Figure 5.

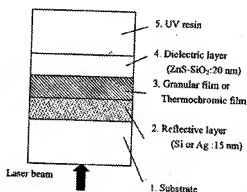


Fig. 5. Cross-sectional view of the sample disk.

The substrate and silver-halide emulsion layer of Drexler et al. read on the granular film layer location 3 of Nomura et al. because they both represent the recording layer of the media, the substrate 1 reads on applicants' polymer layer (Nomura et al. discloses the substrate may be polycarbonate, same as applicants), there is a reflective layer 2 arranged in between the granular film layer and the substrate, and there are tracks, which read on the optically functional structures of claims 7 and 10, on the polycarbonate substrate, which the Examiner deems is intrinsically facing the granular film layer (pp. 1877, col. 2). Nomura et al. disclose that their granular film comprises

small silver particles, wherein the reflectivity is changed by increasing the silver particle size.

Since Nomura et al. and Drexler et al. are both drawn to optical recording media featuring recording layers of silver; it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the substrate with an optically functional structure facing in a specific direction and the reflective layer of Nomura et al. with the substrate and silver-halide emulsion layer of Drexler et al. The results of this combination would have been predictable to one having ordinary skill in the art of CD/DVD manufacture; furthermore, each element would have performed the same in combination as they had separately. The motivation to provide a means for tracking would be to make sure that the disc could be playing in conventional optical recording/reproducing devices; further, the motivation to provide a polymer layer would be to protect the silver halide emulsion layer; furthermore, the motivation to provide a reflective layer is to decrease the required laser intensity to color the recording layer. It would have also been obvious to have the silver-halide emulsion layer arranged to be facing towards the reflective layer because that would guarantee that the maximum amount of radiation was focused on the silver-halide emulsion layer, such that a minimum recording radiation would be required; further, the silver-halide emulsion layer would then be protected on the inside of the disk structure.

The Examiner deems the limitations in claims 1 and 12 that state "whereby by irradiation with a focused laser beam, metallic ions are locally transferred from the donor medium into the storage glass material" and "wherein the information and data

comprises a spatial arrangement of storage material regions with and without metallic particles and ions" represent intended use limitations, which are not dispositive of patentability; however, as evidenced by Wu one of ordinary skill in the art would know how to operate the device of Drexler et al. in view of Nomura et al. to have silver ions diffuse into the glass substrate and/or form silver particles. For example see col. 4, line 51 to col. 5, line 12 and col. 30, lines 3-21, wherein the silver-halide emulsion reads on the Ag^+ ion-containing material of Wu.

With regard to claims 2, 4, 9, these are also intended use limitations of the medium, which are not dispositive of patentability; however, also evidenced by Wu, one of ordinary skill would know how to heat the article to effectuate doping "arranged on at least one side near a flat surface of one of the at least two interconnected disks comprising the storage medium" (i.e. the IIES layer). It is also noted by the Examiner that the substrate of Drexler et al. is flat according to the drawings, and that the substrate is one of the at least two interconnecting disks. Wu discloses that the IIES layer is a surface layer, which reads on applicants' metallic ion doping in proximity of a surface of the storage glass medium. Given the fact that the Examiner has rendered obvious the arrangement of substrate/silver-halide emulsion layer/reflective layer/polymer layer, it is clear that the IIES layer would be facing towards the polymer layer if the medium was irradiated upon as evidenced by Wu. With specific regard to claim 2, Wu evidences that this IIES layer may then be further treated with a high energy beam to record an image (col. 30, lines 3-21). This reduces the metallic ions to

metallic particles, i.e. "silver specks" and "silver metal particles," which reads on applicants' metallic particles or aggregations of metallic particles.

With regard to claim 5, Drexler et al. teach silver-halide emulsions, which read on silver.

Response to Arguments

14. Applicant's arguments, see Remarks, filed 02/05/2009, with respect to the objections to the claims and the rejection of claims 14 and 16 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The relevant objections/rejections have been withdrawn.

15. Applicant's arguments filed 02/05/2009 have been fully considered but are not persuasive.

With regard to the rejections under 35 U.S.C. 112, first paragraph as lacking written description due to new matter concerns, the Examiner respectfully disagrees with applicants' assertions.

With regard to claim 4, the Examiner does not find support in applicants' specification as originally filed to state that the metallic ion doping is arranged in a "surface of one of the at least two interconnected disks comprising the storage medium." It appears from applicants' specification that the metallic ion doping is performed into the glass storage material **only**.

With further regard to claim 4, the Examiner does not find support for the limitation for "a **flat** surface." It has been held that when an explicit limitation in a claim "is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description **requires** that limitation" (emphasis added). *Hyatt v. Boone*, 146 F.3d 1348, 1353, 47 USPQ2d 1128, 1131 (Fed. Cir. 1998). The Examiner does not find support at page 9, paragraphs 1 and 2 or the Figures for the limitation of "a **flat** surface," and notes that the Figures, including Figure 1, are not drawn to scale and do not necessarily require a flat surface as claimed.

With regard to claim 12, the Examiner does not find support for broadly claiming that the information and data "**comprises** a spatial arrangement of storage material regions with and without metallic particles and ions." The Examiner does not find support at the section applicants have suggested (pg.3, paragraph 2) or throughout the originally filed specification and drawings as has also been suggested. The Examiner notes that applicants have only provided two possible methods for storing data or information (i.e. metallic particles and ions), and not **all** possible methods of storing data as is now broadly claimed.

With regard to the rejections under 35 U.S.C. 112, second paragraph, upon further review of the claims the Examiner has discovered new issues that render the claims indefinite.

With regard to the rejection of claims using the prior art, applicants argue that the Examiner has not properly set forth the difference between the prior art, i.e. Wu, and the claims at issue.

The Examiner has therefore further clarified his position in section 12 above. The Examiner deems the granular layer would read on the glass substrate and IIES layer of Wu; however, the Examiner is only purporting to combine in polymer layer of Nomura et al. with its optically functional structure.

Applicants' have asserted that the Examiner has improperly rejected claim 16 by having misread the reference.

The Examiner agrees and has withdrawn the rejection of claim 16. The Examiner notes that the second step of the process in claim 16 cannot be met by a CO₂ laser because such a laser irradiates in the infrared region. The absorption wavelength that would effectuate resonance-enhanced absorption would necessarily be in the blue region as that is where surface plasmon resonances for nanometer sized metallic particle nuclei would occur.

Applicants argue that the references do not teach local doping.

The Examiner disagrees and notes first that the claims can be interpreted in two different ways. Either the article has a layer of metallic ions already doped into the glass storage material **or** the article is a glass storage material with a donor medium situated thereon. With regard to claim 1, this leads the claim to be interpreted as either a product-by-process claim (section 12 above) or as a claim having intended use limitations (section 13). In either case the Examiner has met his burden of rendering

obvious an article identical to that claimed. With specific regard to the term "local," it is a term of degree that renders the claims indefinite. In the first analysis of the claim in section 12, the Examiner deems that the IIES layer of Wu is local doping (i.e. locally transferred) in that the ions are situated in a surface layer and not throughout the glass substrate. In the second analysis of the claim in section 13, the term "local" is apart of the intended use limitations, and as evidenced by Wu the layer can be locally doped as claimed.

Applicants argue that the Examiner has impermissibly grouped together pluralities of claims.

The removal of the rejection of claims 13-17, 19, and 20 using the Wu reference renders this argument moot; however, the Examiner does note that if the references meet all the limitations of the claims, i.e. "is equally applicable" as is stated by applicants, then the rejection is proper. The Examiner also notes that the product-by-process arguments were only directed to the product claims. Lastly, the Examiner has more precisely arranged his claims, such that applicants should not be confused.

Applicants then argue that the Examiner has not performed any of his duties in the Graham factual inquiries.

The Examiner has restructured his rejections above to further make clear the differences between the art and the claims at issue; however, it is noted that the Examiner did in fact provide motivations to modify the references as seen in sections 12 and 13. With regard to the level of ordinary skill in the art, the Examiner inherently provided the level of ordinary skill in the art by stating that the prior art are both drawn to

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optical recording media. Those of ordinary skill in the art of optical recording media would have known that optically functional structures in polymer layers of Nomura et al. are well known to be combined with recording layers, which is the glass substrate and IIES layer of Wu.

Applicants also suggest that the Examiner is modifying art that teaches away from such a modification and would render the art inoperable.

The Examiner disagrees and notes that the polymer layer of Nomura et al. would be placed over the glass substrate with an IIES layer and reflective layer of Wu. This would not be an inoperable structure, neither reference teaches away from the combination, and the combination does yield the claimed structure. Also in response to applicant's argument in this regard, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The Examiner maintains that one of ordinary skill would know how to form an optical recording medium with the claimed structure.

Applicants argue that the Examiner has used hindsight rationale.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was

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within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The Examiner maintains that the modification of Wu to provide a polymer layer with an optically functional structure would have been obvious to one having ordinary skill in the art of optical recording media.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Examiner has cited various stained glasses, either with developed silver images or silver ions of differing refractive indices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERARD T. HIGGINS whose telephone number is (571)270-3467. The examiner can normally be reached on M-F 9:30am-7pm est. (1st Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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